2004 Baseline Survey of **North Fork Juda Branch**

Lower Sugar River Watershed (SP11), Sugar/Pecatonica Basin

Green County

877700

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The North Fork Juda Branch is a 3 mile long stream that joins Juda Branch in the Village of Juda. It is on the state's list of impaired waters and has been historically affected by agricultural nonpoint source pollution and wastewater discharge from Sylvester Whey. While it has the potential to support a diverse forage fishery, it currently only contains a limited number of forage species.

On September 20, 2004 a baseline survey was conducted on the North Fork Juda Branch and Juda Branch. Two sites were surveyed on North Fork Juda Branch: Site 1 was a 132 meter stretch upstream from County Highway S; Site 2 was a 148 meter stretch upstream from the Sylvester Whey effluent ditch; and Site 3 was a 116 meter stretch upstream from CTH S. A habitat and macroinvertebrate evaluation was conducted at Site 1, however the results of these surveys are not yet available. Each fish survey was conducted with a DC backpack shocker. All fish species were collected in order to determine an Index of Biotic Integrity (IBI).

Site 1 – Upstream CTH S
This site is upstream from CTH S and downstream of the Sylvester Whey effluent ditch. The stream is channelized and averages 3.4 meters wide and averages about 0.2 meters deep although the deepest water is within the first 50 meters from the bridge. Upstream from this point, the stream enters a box elder corridor and is fairly wide (3-4 meters) and very shallow (0.1 meters deep). The stream banks are fairly well vegetated in the first 50 meters because they are residential lots where the canopy is open and sunlight aids growth of plants. Beyond that point, the box elders line the stream. The banks are 0.3-1.3 meters tall and raw, with many trees falling into the water. The bottom was mostly silt and clay. The following fish species were collected:

Species	**Number**
Johnny Darter	30
Creek Chub	2
Brook Stickleback	1
White Sucker	2
Fathead Minnow	1

It should be noted that all of the fish were collected in the first 40 meters of stream, with no fish collected the balance of the segment (another 92 meters). The warm-water IBI was 30 (fair).

Site 2 – Upstream from Sylvester Whey Effluent Ditch
This section is channelized and averages about 2 meters wide and about 0.1 meters deep. It flows through a box elder corridor that is surrounded mostly by row crops in which the buffer varies between 0.5 and 3 meters. Stream banks range from 0.3 to 1.5 meters high and are mostly raw and very susceptible to flashy flows. The bottom is mostly silt but actually has about 20% riffle areas with a gravel and rubble/cobble bottom. There was a high temperature differential between the stream at this point (56^{o}F) and the effluent ditch (80^{o}F). A white, milky substance was noted at the junction of the stream and effluent ditch. The following fish species were collected:

Species	**Number**
Creek Chub	8

Johnny Darter	5
Fathead Minnow	1

An IBI was not calculated for this section as the minimum number of fish was not found.

Site 3 – Juda Branch, Upstream from CTH S

This stream section was sampled for comparison sake with North Fork Juda Branch. It should be noted that the riparian corridor for these two streams differs greatly in that this portion of the Juda Branch flows through a well buffered wetland area. This section is channelized, but is narrow (1.5 meters wide) and deep 0.6 meters). The bank height varies between 0 and 0.3 meters high and is well vegetated. There is good overhanging vegetation. The bottom is mostly silt up to 0.5 meters deep likely from the heavy agriculture in upper portions of this stream (upstream from CTH KS) and the decomposing vegetation from the wetland area. The following fish species were collected:

Species	**Number**
White Sucker	27
Creek Chub	6
Johnny Darter	8
Green Sunfish	1
Brook Stickleback	1

Additionally, three brown trout were collected: 13.5", 16.5", 18.0"

The warm-water IBI is 23 (poor). The coldwater IBI is 0 (very poor). It should be noted that the catch rate would have been better if using a stream shocker as many fish were able to elude the backpack shocker.

Summary

The fish assemblage reflects the highly degraded condition of the North Fork Juda Branch. In addition to the poor habitat conditions, it is very likely the fishery is being impacted by point source discharges from Sylvester Whey. An attempt was made to obtain a macroinvertebrate sample from downstream of the effluent discharge: however, a sample of a sufficient number of organisms could not be found. A few *Gammerus* and leaches were noted along with a few gastropods, but the total number was less than 10. Sorting the sample was difficult due to whey product in the benthos. Heavy row crops in the area, with very little buffer and poor bank vegetation make this stream wide and shallow. Box elders prevent much in the way of primary production and add to erosion of the banks.

Juda Branch holds more promise in that the lower area runs though a well buffered wetland area. Depth and overhanging vegetation provide habitat for fish. Still, it was a surprise to find 3 large brown trout in this section. Since Juda Branch is not stocked, these fish are likely coming from Sylvester Creek or the Sugar River. There were no other cold/cool water indicators save for 1 brook stickleback. The bottom was mostly silt, making trout reproduction unlikely. If sediment sources from upstream could be controlled, this small stream might hold a fair number of gamefish.

Management Recommendations

Employ agricultural best management practices in the watershed to mitigate nonpoint source pollution. (Both streams).

Remove box elders from North Fork Juda Branch, slope and stabilize the banks.

Work with wastewater to control discharges from Sylvester Whey to the North Fork Juda Branch.

Conduct another fisheries assessment of Juda Branch using a stream shocker.

Deploy temperature monitoring devices in Juda Branch to determine thermal regime of this stream.